

Pinter and Ishman (2008) claim that 14 markers found by Firestone et al. (2007) in the Younger Dryas impact layer (YDB) are from the “*constant noncatastrophic rain of micrometeorites.*” Their hypothesis is unsupportable.

(A) Karner et al. (2003) reported accretion of ET material equaling $2.5 \times 10^9 \text{ g yr}^{-1}$, consistent with 28 studies covering 67 myrs. Consequently, YDB material, averaging $14.13 \times 10^{13} \text{ g yr}^{-1}$, equates to 56,500 years of accumulation.ⁱ

(B) Rudnick and Gao (2003) cited four studies reporting global iridium concentrations of 0.022 ng g⁻¹. YDB iridium averaged 1.94 ng g⁻¹, or 88 times crustal abundance, while iridium was undetectable outside that layer.ⁱ

(C) Carlisle et al. (1991) discovered 45 ppm of nanodiamonds in Canadian K/T clay with none above or below. YDB nanodiamonds are inside glass-like carbon at ~3% volume with none in other strata tested.ⁱ

(D) At Blackwater Draw, the Clovis type-site, Haynes et al. (1999) conclude from 27 radiocarbon dates that any YDB hiatus lasted “*no more than a decade,*” insufficient to yield high marker concentrations.ⁱ

(E) The authors claim that the 14 markers require an impactor that is an impossible “*Frankenstein monster ... incompatible with any impact event.*” They overlooked the K/T, where 9 of 14 markers form significant peaks, and the other 5 markers are consistent with intense wildfires.ⁱ

The authors’ “*constant rain*” hypothesis is refuted by significant peaks in 14 impact-related YDB markers, which are found at concentrations far above stratigraphic background. We cannot identify a single widespread stratum in Earth's geological record containing synchronous peaks in microspherules, iridium, nanodiamonds, charcoal, fullerenes, helium-3, and the other markers, which are *not* widely considered to result from an impact. We stand by our data and reject the authors’ conjectures.

REFERENCES CITED

Firestone, et al., 2007, *PNAS*, V. 104, pp. 16016-16021.

Karner, et al., 2003, *GCA*, v. 67, no. 4, pp. 751-763.

Rudnick, R, & Gao, R, 2003, *Treatise on Geochemistry*, eds. Holland, H, Turekian, K (Elsevier, Oxford, UK), Vol 3, pp 1–64.

Carlisle, D. B. & Braman, D. R., 1991, *Nature* 352, 708-709.

Haynes CV, Jr, et al., 1999 *Geoarchaeology* 14(5):455–470.

ⁱ Calculations at <http://ie.lbl.gov/mammoth/GSAToday.html>